

**1. How do people get *Salmonella* infections from turtles?**

*Salmonella* is a bacteria that lives in the intestinal tract of most reptiles, including turtles. *Salmonella* bacteria may be present in the feces of these animals, and can cause infection in people if they do not wash their hands after contact with turtles, their feces, or objects or surfaces contaminated with the feces. In this outbreak, many of the patients reported touching the turtle or cleaning the turtle habitat before their illness.

**2. How serious are *Salmonella* infections and who is at highest risk of severe infection?**

Symptoms of *Salmonella* include diarrhea, fever, and abdominal cramps beginning 12 to 72 hours after a person is infected. In some people, the diarrhea may be bloody, and sometimes illness is severe enough that the patient needs to be hospitalized. Occasionally, the *Salmonella* bacteria may spread to the bloodstream and other body sites, and this can cause death unless the person is treated promptly with antibiotics. Infants, young children, the elderly, and persons with impaired immune systems are the most likely to have a severe illness from *Salmonella* infection. Earlier this year, a fatal *Salmonella* infection occurred in a 3-week old infant exposed to a pet turtle. In this outbreak, 24 (30%) of 80 patients were hospitalized, and three (4%) developed bloodstream infections. Many reported that their illnesses lasted several weeks.

**3. Is there any way to certify that a turtle is free of *Salmonella*?**

You cannot tell by looking at a turtle whether it has *Salmonella*; turtles colonized with *Salmonella* usually do not appear sick. Following the ban on the sale of turtles <4 inches in length in 1975, many people tried various techniques to raise turtles that were free of *Salmonella* bacteria. Some people claim to sell turtles that are "*Salmonella*-free". However, no method to eliminate *Salmonella* from turtles has proven successful. Some attempts to eliminate *Salmonella* from turtles have resulted in the development of antibiotic-resistant strains of *Salmonella* bacteria. Even turtles that may not be colonized with *Salmonella* when they are hatched can acquire *Salmonella* from their surroundings, particularly during lengthy holding periods before and during shipment, when they are packed with hundreds of other turtles. In addition, because turtles can shed *Salmonella* intermittently, and many different factors, including stress, can cause a turtle to start shedding *Salmonella* in its feces, there is no way to ensure that a turtle is free of *Salmonella*.

**4. What is the purpose of the ban on the sale and distribution of small turtles in the United States?**

The purpose of the federal ban on the sale and distribution of turtles <4 inches in length is to prevent turtle-associated *Salmonella* infections, particularly in children. The ban was enacted following multiple investigations of turtle-associated *Salmonella* illnesses in children during the 1960s and 1970s. While turtles of all sizes can carry *Salmonella*, small turtles are a particular hazard for children because their small size makes them appear safer to parents as a pet, and children and infants are more likely to play with a small turtle like a toy, sometimes even putting them in their mouths. Before the ban was enacted in the United States in 1975, an estimated 280,000 *Salmonella* infections per year were associated with turtle contact. The ban is estimated to prevent 100,000 *Salmonella* infections in children each year.

**5. If it's illegal to sell baby turtles, how are they still being sold and causing human *Salmonella* infections?**

Turtles <4 inches in length may only be legally sold for 'bona fide scientific, educational, or exhibitional purposes' and not to consumers as pets. However, this law has proven difficult to enforce. In this outbreak, most (86%) of the turtles associated with human *Salmonella* infections were <4 inches in length, and 36% of them had been purchased at a pet shop. An additional 37% were purchased from largely unregulated vendor sites, including flea markets and street vendors; these turtles were being kept as household pets. These data demonstrate that sales of small turtles still occur, and one consequence is that human infections linked to small turtles continue. Further efforts are needed to prevent the sale and distribution of small turtles.

## **6. Why are turtles the only reptiles that have legislation banning their sale?**

While all reptiles can carry *Salmonella*, turtles pose a particular risk for children and infants. Young children are more likely to directly contact small turtles than other reptiles. Other reptiles, such as snakes or iguanas, are unlikely to be given to a small child or infant to handle. Turtles, and especially baby turtles, appear safer than other reptiles because they do not bite or scratch, and are less likely to escape due to their slow speed. In addition, the water in the turtle bowl can be heavily contaminated with *Salmonella*, and young children who splash in the water may easily become infected. Because children and infants are at increased risk of severe *Salmonella* infection, the ban is intended to protect these vulnerable age groups from reptile exposures that they are most likely to encounter.

## **7. Why do we need a ban? Why can't we just educate people?**

Although it has been known for several decades that reptiles are a source of human *Salmonella* infections, efforts to educate people about the dangers of reptile contact have proven to be largely unsuccessful. It has been documented previously in reptile-associated *Salmonella* outbreaks that most ill patients did not consider their pet reptile to be a possible source of their infection. In this outbreak, only 20% of ill patients reported that they were aware of a connection between reptile contact and human *Salmonella* infection.

## **8. What should people do who already have pet turtles in the home?**

If there is an infant, young child, or immunocompromised person in the household, a reptile is not the best pet. If you want to give up your turtle, it is best to contact your veterinarian, local zoo, humane society, or health department.

## **9. Are other reptiles safe to have as pets?**

Because all reptiles carry *Salmonella*, households that have an infant, small child, elderly person, or immunocompromised person should not keep reptiles as pets. Children <5 years of age should avoid any contact with reptiles and amphibians. To reduce the chances of family members getting sick with salmonellosis, reptile owners should:

- Wash hands with soap and water immediately after handling a reptile;
- Launder any clothing the reptile might have touched;
- Not allow reptiles to roam the house freely;
- Keep reptiles out of kitchens; and
- Use soap or a disinfectant to thoroughly clean any surfaces that have been in contact with reptiles;
- Ensure that guests in the home follow the same precautions to prevent infection.

## **10. Where can I get more information on this topic?**

For more information on reptile-associated *Salmonella* infections, please refer to the following sites / articles:

- CDC website
  - <http://www.cdc.gov/Features/ReptilesSalmonella/>
- Other CDC MMWR articles
  - <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5626a1.htm>
  - <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5249a3.htm>
  - <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4844a1.htm>
  - <http://wonder.cdc.gov/wonder/prevguid/m0037004/m0037004.asp>
- Association of Reptilian and Amphibian Veterinarians information site
  - <http://www.arav.org/SalmonellaOwner.htm>

If you have questions, please contact your local health department or call the Arizona Department of Health at 602-364-4562.